

REMARKS

The Examiner has objected to claim 19 under 37 C.F.R. 1.75 as being a duplicate of claim 3. Applicants respectfully urge that these claims are not duplicates in wording or in scope. Claim 3 relates to a degraded cellulose ether having a Höppler viscosity of ≤ 50 mPas, while claim 19 relates to a degraded cellulose ether having a Höppler viscosity of ≤ 5 mPas. Applicants submit that this distinction between claims 3 and 19 relates to a difference in the physical properties of the resulting degraded cellulose ethers formed by the inventive process. It is therefore respectfully requested that this objection be withdrawn.

The examiner has rejected claims 1-8, 10, 11, and 19-21 under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants respectfully submit that this ground of rejection has been overcome by the instant amendment. As suggested by the Examiner, Applicants have amended Claim 1 to state that the percentages of Claim 1 are *based on the weight of the cellulose ether*. Claim 1 now reads, "at least one oxidizing agent is added to the concentrated aqueous slurry in an amount of between 0.05 and 5% by weight based on the cellulose ether". Support for this amendment can be found in the specification on page 6, lines 26-28. It is respectfully asserted that the 35 U.S.C. 112 rejection has been overcome by the instant amendment, and that the rejection should be withdrawn.

The examiner has rejected claims 1-8, 10, 11, and 19-21 under 35 U.S.C. 103 over Traill et al. in view of Hilbig et al. It is respectfully urged that this ground of rejection should be withdrawn.

The present invention claims a process for the depolymerization of hot water-coagulable cellulose ethers by hydrolytic degradation by means of acids. The degradation is carried out at a temperature above the cloud point of the cellulose ether as concentrated aqueous

slurry. According to the claims, at least one oxidizing agent is added to the concentrated aqueous slurry in an amount of between 0.05 and 5% by weight based on the cellulose ether, before, during and/or after the depolymerization in acidic or neutral medium.

The examiner takes the position that Traill et al. teaches each feature of the present claims except for the addition of an oxidizing agent as described in the present claim 1. In an effort to fill this void, the examiner cites Hilbig. However, Applicants respectfully submit that the examiner is merely selecting and combining features from references where there is no suggestion in those references to do so. Further, it is urged that even upon such a combination, the present claims would not be obviated.

Traill et al. relates to a method for making cellulose ethers. In particular, Traill teaches a process of lowering the viscosity of cellulose ethers by treating a high viscosity cellulose ether with a dilute acid at an elevated temperature (115 - 160°C) and elevated pressure for approximately 20 minutes to 1 hour (see Traill, page 1, lines 23-39) until the viscosity of the ether has been reduced as far as desired. The acid concentration is in the range of 0.5 to 5.0% by weight (see Traill, page 1, line 93). Hydrochloric acid may be employed as the acid (see Example 1), and the weight of the dilute acid is shown as being several times higher than the weight of the cellulose ether. Importantly, as the examiner admits, Traill, et al does not disclose nor suggest the inclusion of an oxidizing agent during his process. Also, Table 1 of the present invention shows that the amount of hydrochloric acid in the present invention represents a small weight percentage, ranging from about 4 to about 16% by weight, of the dry cellulose ether. Thus, in this further respect, Applicants respectfully urge that the disclosure of Traill actually *teaches away* from the present invention. It is further urged that one skilled in the art would not have been inspired to look to the teachings of Traill et al. in an effort to devise the presently claimed invention.

Traill teaches a process for reducing the viscosity of a cellulose ether, in which the cellulose ether is treated with a dilute acid, usually at elevated pressure and increased temperature. The weight of the dilute acid is several times higher than the weight of the

cellulose ether (col. 1, l. 33 - 44). The degradation of the cellulose ether thus takes place in an aqueous acidic environment.

As stated above, the examiner attempts to fill the void of Traill by citing Hilbig. Hilbig relates to a process for forming low molecular weight polysaccharide ethers. Indeed Hilbig discloses a controlled oxidative degradation or depolymerization of a polysaccharide ether. However, Applicants again urge that the teachings of Hilbig differ from those of the present invention such that one skilled in the art would not have looked to Hilbig in an effort to formulate the present invention.

Hilbig teaches an oxidative process for reducing the viscosity of a polysaccharide ether, particularly a cellulose ether (see col.3, line 62 to col.4, line 29). In contrast to the present invention, according to Hilbig's process a suspension of the cellulose ether is treated with perborate as an oxidizing agent in an alkaline medium. This is specifically disclosed at column 6, lines 46-49 of Hilbig, which states that "the depolymerization of polysaccharide ethers takes place in an alkaline medium, i.e. at a pH of the slurry or suspension of greater than 7, preferably from 7-14." Further information is provided in Hilbig regarding the type of base, its amount relative to the amount of cellulose, and how and when it should be added, as shown in column 6, line 49 to column 7, line 5.

Applicants urge that the disclosure of Hilbig *teaches away* from using perborate, or any other oxidizing agent, in an acidic environment. It is therefore submitted that a person of ordinary skill in the art *would not* have found any motivation to employ the perborate of Hilbig in an acidic medium as taught by Traill. At best, the person of ordinary skill would have ended up with a two-step process in which the cellulose ether is depolymerized in an acidic environment and then further depolymerized by action of an oxidant, or vice versa. This would still teach away from the presently claimed invention.

On page 4 of the Office Action, the examiner argues that the pH range of from 7 to 14, as taught by Hilbig, overlaps with part of the pH range set forth in the present claim 10. Applicants respectfully point out that the present claim 10 does not refer to the pH range during the *depolymerization* process, but rather to a pH range in a subsequent *washing*

step. This further washing step provides a purification of the cellulose which already has a reduced molecular weight. It is therefore respectfully urged that the examiner's arguments against the present claim 10 are invalid.

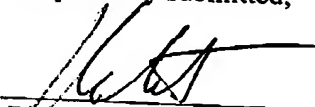
Hilbig does not disclose or suggest use of an *acid* in an aqueous slurry. Rather, it describes a process using *alkaline* reaction conditions, while the present invention uses *acidic* reaction conditions. Furthermore, the present invention teaches a decrease in viscosity as a result of non-oxidative chain shortening, which is a *hydrolic degradation* of the polymer chain in the presence of acid as a catalyst. In contrast, the Hilbig reference discloses a downward adjustment of molecular weight, and hence a reduction in viscosity, due to an *oxidative depolymerization*. It is urged that Hilbig clearly teaches away from adding hydrogen peroxide to an aqueous, strongly acidic slurry of a cellulose ether, and that there would be no suggestion to those skilled in the art to add Hilbig's oxidizing agent to Traill's composition. Applicants respectfully submit that the examiner is impermissibly reconstructing the art in light of applicant's disclosure.

For the above reasons, it is urged that a person of ordinary skill in the art would not have been inspired to look to the disclosure of Hilbig or Traill, either alone or in combination, in an effort to formulate the presently claimed invention. It is urged that there is nothing in the cited art which would teach or suggest how or why one would combine the teachings of these references in an effort to devise the presently claimed invention. Applicants therefore respectfully request that the 35 U.S.C. 103 rejection be withdrawn.

The undersigned respectfully requests re-examination of this application and believes it is now in condition for allowance. Such action is requested. If the examiner believes there is any matter which prevents allowance of the present application, it is requested that the

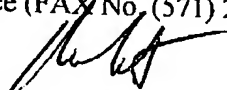
undersigned be contacted to arrange for an interview which may expedite prosecution.

Respectfully submitted,



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I hereby certify that this paper is being facsimile transmitted to the United States Patent and Trademark Office (FAX No. (571) 273-8300) on July 18, 2005.



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